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(54) HOUSING FOR ELECTRICAL APPARATUS

(57) The invention relates to a housing for electrical apparatus, especially for differential current detectors that can be coupled to automatic switches, comprising a base (1) and a lid (2) defining the location of the corresponding mechanism. An L-shaped piece (5) is coupled to the said array, said piece being fitted in such a way as to allow for a limited insertion and removal movement in a hole (6) on one side of the base (1). Said piece (5) defines channels (7) that are alternately defined by the inner and outer side of said piece. The external connecting wires can be located in said channels in relation to the corresponding application disconector.

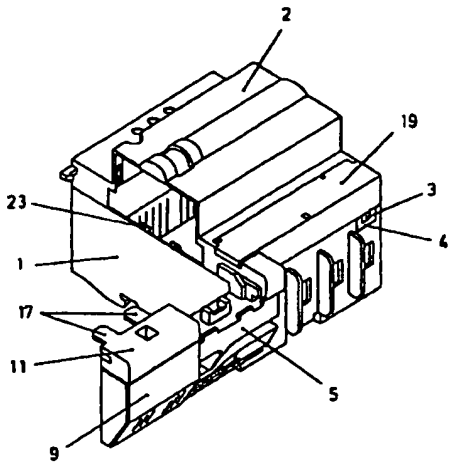

Fig.1

EP 1 100 104 A1

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Description

[0001] In the electrical supply facilities there are apparatus with automatic current interruption devices as a security and to establish the necessary limitations against overcurrents that surpass the anticipated limits.

[0002] To these effects circuit-breakers are used, which can be installed connected to differential current detecting devices, establishing the necessary interconnections between the respective apparatus by means of external cables.

[0003] The external disposition of the connection cables forces to the use of sheathed cables with an insulating cover, which however does not really guarantee the isolation, since the cables remain with their sheathing as their only protection. The latter can be damaged, with the corresponding risk of discharge or short circuit.

[0004] On the other hand, the differential current detecting devices are formed by a structural set in which it is complicated to assemble the corresponding mechanisms, as well as the connection between the parts that determine the respective external housing.

[0005] According to the present invention, a housing is proposed for electrical apparatus and especially for the mentioned differential current detecting devices, with which some characteristics are obtained which solve the previously indicated problems in a satisfactory way, bringing essentially about some important constructive and functional advantages.

[0006] This housing, object of the invention consists in a base and a lid, which determine the location of the mechanisms for the apparatus and of the connection terminals, establishing the connection between the mentioned elements by means of a simple fitting and the fixing by means of the respective hooking adaptors, while in connection with the mentioned set an L-shaped piece is connected, which has one of its branches emerging laterally and the other branch is housed in a lateral casing of the base, with the possibility of a limited insertion and extraction movement, determining said piece on both sides some grooves that extend along the whole interior branch and partially along the external one, in which the external connection cables of the apparatus can be located with the respective disconnector.

[0007] The mobile disposition of the L-shaped piece allows its location to situate the disconnector laterally embedded, while with the subsequent movement of the mentioned piece towards the inside of the base, the inclusion of the connector cables is determined in connection with the disconnector terminals.

[0008] On the external branch of the mentioned L-shaped piece some fastening lids are clipped on. They cover the outer part of the cable location grooves; while on the upper edge some accessory insertable pieces are situated to guide and block by means of a hooking button, from which some lugs located on the disconnector terminal come out in projection, sealing their access.

[0009] On the terminal area of the differential current detecting device itself a lid is in turn situated in a tiltable assembly, which can assure the closing by means of an auxiliary sealing, so as to avoid the access to said terminals by unauthorized people.

[0010] The switching mechanism of the mentioned differential current detecting device is situated on a support, which has included a lug, by means of which the fastening of this support is established by insertion into a fitting groove defined in a lateral wall of the base.

[0011] This way a housing is obtained whose set is very easy to couple when assembling, since all the connections are establishedby simple matching of the component elements.

[0012] The connection with regard to the corresponding disconnector is in turn easy to be carried out because of the mobility of the piece to house the connection cables; while for the mentioned connection bare cables can be used, remaining perfectly isolated in their place, without any possibility that they could accidentally contact one another, or that an external contact could be established, avoiding the risk of electric discharge.

[0013] In view of this, the preconized housing certainly has some very advantageous characteristics, acquiring own life and preferable character of application in the apparatus for which they are destined.

Figure 1 shows a perspective of the preconized housing without the support for the switching mechanism and with the locating piece for the external connection cable only partially covered by the corresponding lids.

Figure 2 is an exploded perspective of the partial housing set formed by the base, the lid and the external connection cable housing.

Figure 3 is a perspective of the base and of the external connection cable housing, in a faced disposition of the mentioned elements according to the correlative assembly position.

Figure 4 es a perspective as the one of the previous figure, having the elements coupled. A partial cutting in the base has been carried out so that the insertion of the external cable locating part can be appreciated.

Figures 5 and 6 are both perspectives of the external cable housing, observing the mentioned piece respectively from its outer and inner part.

Figure 7 is a perspective of the piece which can be incorporated to cover the access to the application disconnector terminals.

BNSDOCID: <EP_____1100104A1_I_>

Figure 8 is a perspective of the blocking key of the previous piece.

Figure 9 is a perspective where the inner part of an external covering lid of the external cable locating piece can be seen.

Figure 10 is a perspective of the covering lid of the access to the differential current detector terminals in the preconized housing.

Figure 11 is a perspective of the support of the switch mechanism which can be incorporated in the housing.

[0014] The object of the invention refers to a housing for a differential current detector to be connected to automatic switches, such as disconnectors, which are situated in electrical supply installations, having security and control functions.

[0015] The mentioned housing is made up of a base (1) which forms the location for the corresponding mechanisms for the apparatus, as well as the space for the connection terminals. To this housing a lid (2) which closes the whole set can be connected at the upper part.

[0016] The connection between the base (1) and the lid (2) is established by means of a simple union fitting determining the fixing of the installation by the retaining hooks between the respective conformations (3) and (4) producing an elastic hooking by mere insertion.

[0017] Referring to the mentioned set, an L-shaped piece (5) is connected, which is inserted with one of its branches into alocation (6) defined at a side of the base (1) with frontal opening.

[0018] The mentioned piece (5) remains in assembly disposition with the external branch laterally outstanding regarding the base (1), while in the connection insertion there is the possibility of a certain movement towards the inside and the outside of the locating hole (6).

[0019] Along its external branch, this piece (5) has partially some groovings (7), defined alternatingly at one and the other side, corresponding those of the external part at their end with some holes (8) which go till the inside; these grooves (7) are prolonged in turn correspondingly along the whole insertion branch, as indicated on figures 5 and 6.

[0020] The disposition of the mentioned piece (5) in the assembly is so that its external branch remains in its position before a lateral area where it is possible to incorporate the disconnector of application of the differential current detector that can be located in the preconized housing, so that the electric connection between both apparatus can be carried out by means of cable bridges which can be situated in the grooves (7), with which said cables remain perfectly isolated from each other, even if they are bare cables, since their separation in the grooves (7) assures the necessary isolation in an efficient way.

[0021] The differential current detector and the application disconnector can be incorporated in the installation on the same fastening device, by means of the corresponding assembly items (8), as those situated at the rear part of the base (1), in such a way that the connection cables that leave the differential current detector are housed in the grooves (7) of the piece (5), which moves towards the outside to allow the positioning of the disconnector faced to it and once situated the disconnector in that position said piece (5) is moved towards the inside, with which the ends of the connection cables will be situated correspondingly in the disconnector terminals, being it only necessary to fasten the pressure screws of these terminals to assure the connection.

[0022] For the protection of the cables housed in the grooves (7) of the external part, some external covering lids (9). These lids are incorporated on the piece (5), which have a rod (24) divided into two flexible halves with enlarged end, as it can be observed on figure 9, by means of which the fastening in the assembly is carried out by inserting them into corresponding holes (10) in the piece (5), as it can be observed on figures 5 and 6.

[0023] On the upper edge of the same external branch of the piece (5) some accessory pieces (11) as the one represented on figure 7 are also incorporated, they are situated in the assembly on conformations (12), which are secured in the installation by anchoring by means of an actionable button (13), as the one represented on figure 8. This button is introduced through a hole (14) in the respective piece (11), this button (13) has some dented lugs (15) by means of which it is hooked in a corresponding conformation (16) of the branch of the piece (5) through pressure, establishing this way a protection that impedes the disassembly.

[0024] The pieces (11) have some lugs (17) that stand out at the rear, so that the mentioned lugs (17) are located correspondingly in the assembly disposition above the manipulation accesses of the terminals of the coupled disconnector, this way establishing a protection seal regarding the mentioned terminals.

[0025] The apparatus of application can have two, three or four connections, in which case the dimensions of the base (1), the lid (2) and the piece (5) will be adapted in each case, so that the piece (5) does not vary regarding the insertion branch in the base (1), but on the contrary the external branch is half the length in the realization for two connections.

[0026] The lids (9) and the pieces (11) are foreseen in a modular way according to a unique realization measure, corresponding with the dimensions of the external branch of the piece (5) according to the realization for two connections, so that for the realization of four connections two lids (9) and two pieces (11) can be

incorporated, covering this way the dimension of the external branch of the piece (5).

[0027] On the housing area (18) for the differential current detector terminals, on the other hand the disposition of a tiltable cover (19) is foreseen, as the one represented on figure 10. It can be secured by means of an accessory seal through a hole (20), so as to avoid unauthorized manipulations to the mentioned terminals of the apparatus.

[0028] The switch mechanism of the differential current detector can be incorporated in a support (21), as the one represented on figure 11, which is provided with an outstanding lug (22), by means of which the fitting in a groove (23) defined in the lateral wall of the base (1) is possible, with opening towards the top, so that the assembly of the mentioned support (21) of the switch mechanism in the apparatus set can be carried out by means of a simple insertion connection, being it possible to incorporate the elements of the mechanism in the support (21) with the latter outside the housing, to carry out the connection subsequently.

Claims

1. Housing for electrical apparatus, of the type of differential current detectors connectable to automatic switches including a base (1) which locates the mechanisms and a covering lid (2). The set is coupled by fitting and retention by means of hooking between the respective conformations (3) and (4), characterized in that in connection with the mentioned set an L-shaped piece (5) is coupled, which is prepared with one of its branches housed in a fitting hole (6) defined in a side of the base (1), with possibility of a limited introduction and extraction movement during the installation, while the other branch of the piece (5) stands out laterally, to situate from behind an application disconnector; determining the mentioned piece (5) some grooves (7) alternately defined on one and the other face, which extend partially along the external branch, with continuation along the whole connection branch in the hole (6), in whose grooves (7) the external connection cables can be situated regarding the application disconnector.

2. Housing for electrical apparatus, according to the first claim, characterized in that on the external part of the external branch of the piece (5) some modular lids (9) are incorporated, which are fitted by means of a rod (24) which is insertable in corresponding holes (10) of the mentioned piece (5) building up these lids (9) a protection cover that isolates the cables housed in the grooves (7) from the external part.

3. Housing for electrical apparatus, according to the first claim, characterized in that on the upper edge of the external branch of the piece (5) some modular pieces (11) are incorporated, which are hooked up by means of an actionable button (13) incorporated through them; these pieces (11) have some outstanding lugs (17)which are located in the corresponding installation above the access to the terminals of the application disconnector establishing a protection seal regarding the mentioned terminals.

4. Housing for electrical apparatus, according to the first claim, characterized in that in the side wall of the base (1) a groove (23), open at its upper part, is defined, regarding which the support (21) of the mechanism switch of the apparatus can be adapted, and of which a lug (22) comes out that can be inserted in the mentioned groove (23) of the base (1) for the connection during the installation.

5. Housing for electrical apparatus, according to the first claim, characterized in that on the location area (18) of the terminals of the apparatus that can be incorporated in the housing a tiltable lid (19) is situated that can be assured by means of an accessory seal through a hole (20).

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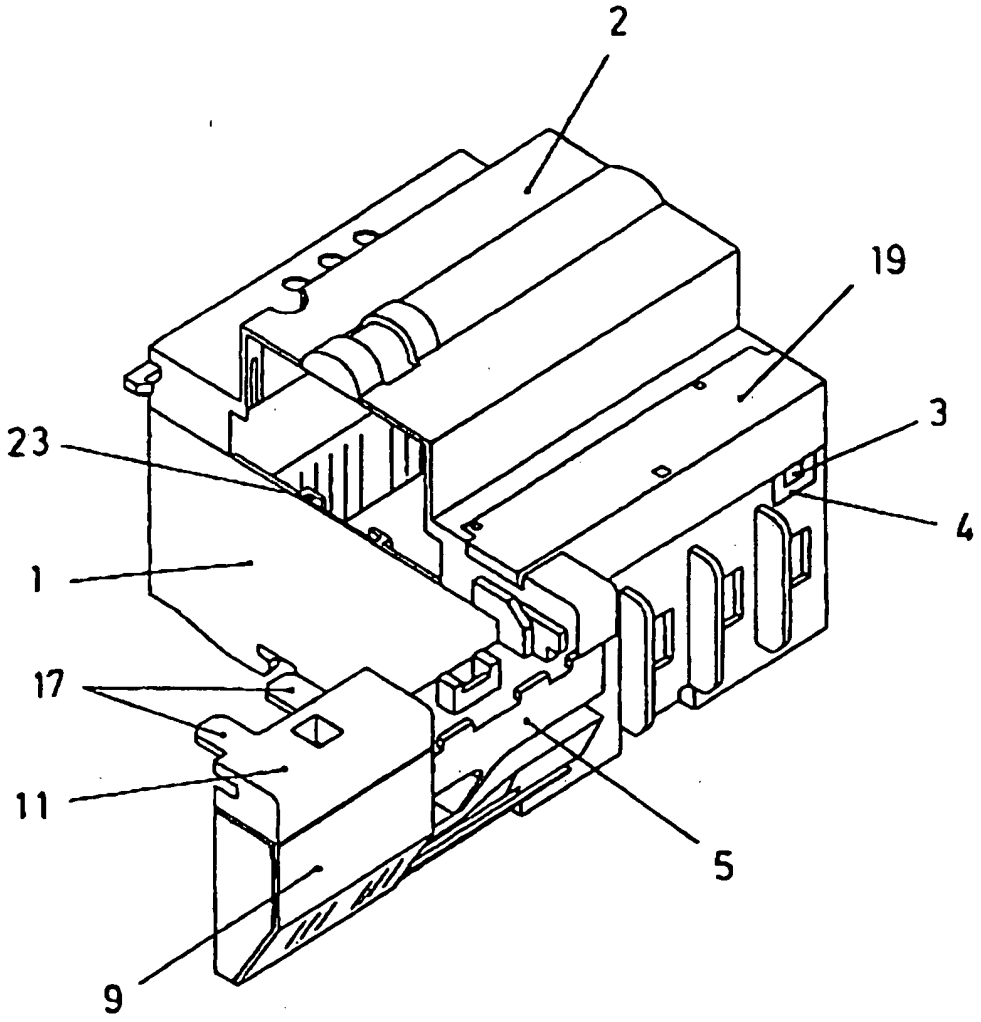

Fig. 1

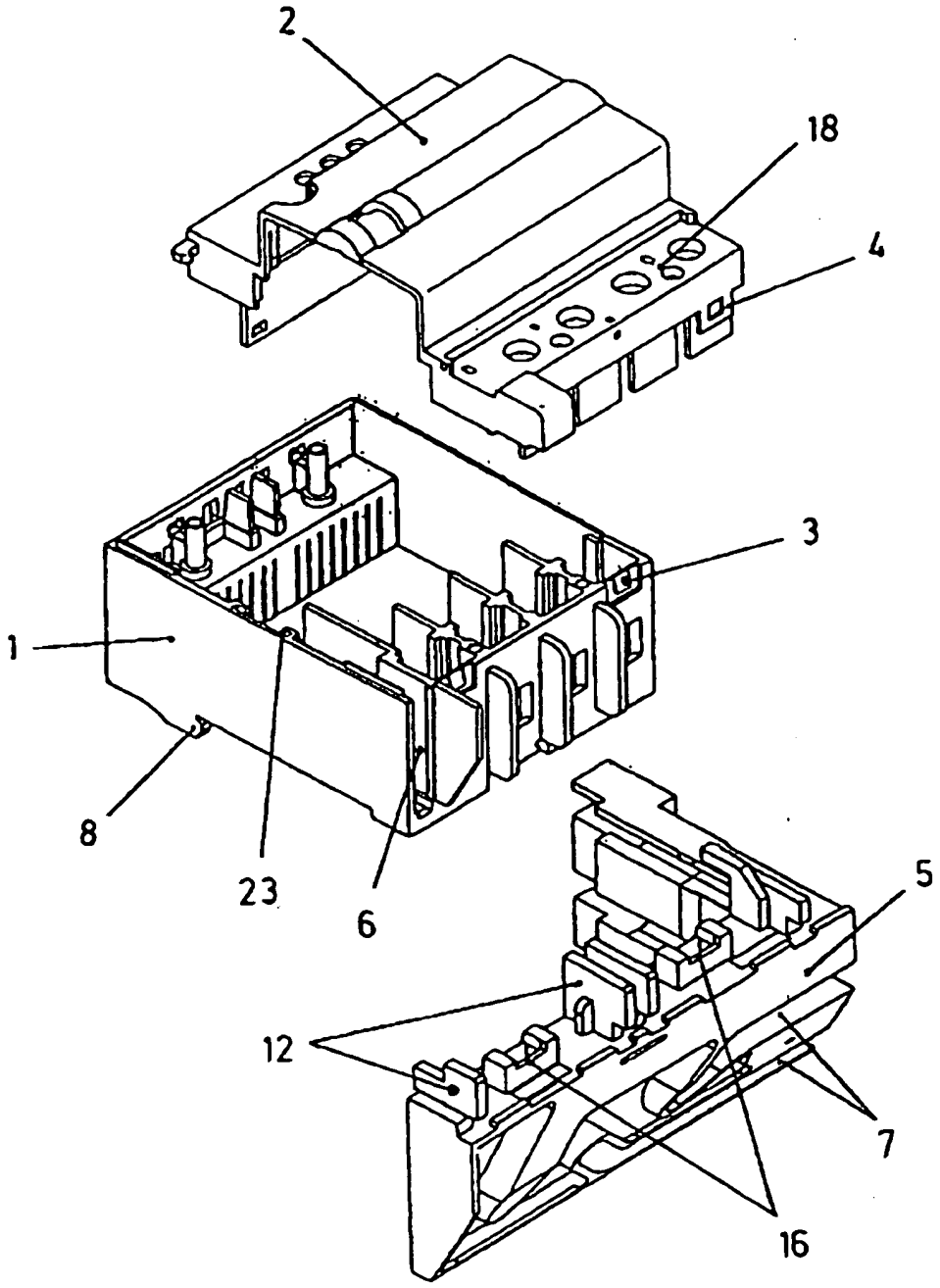

Fig. 2

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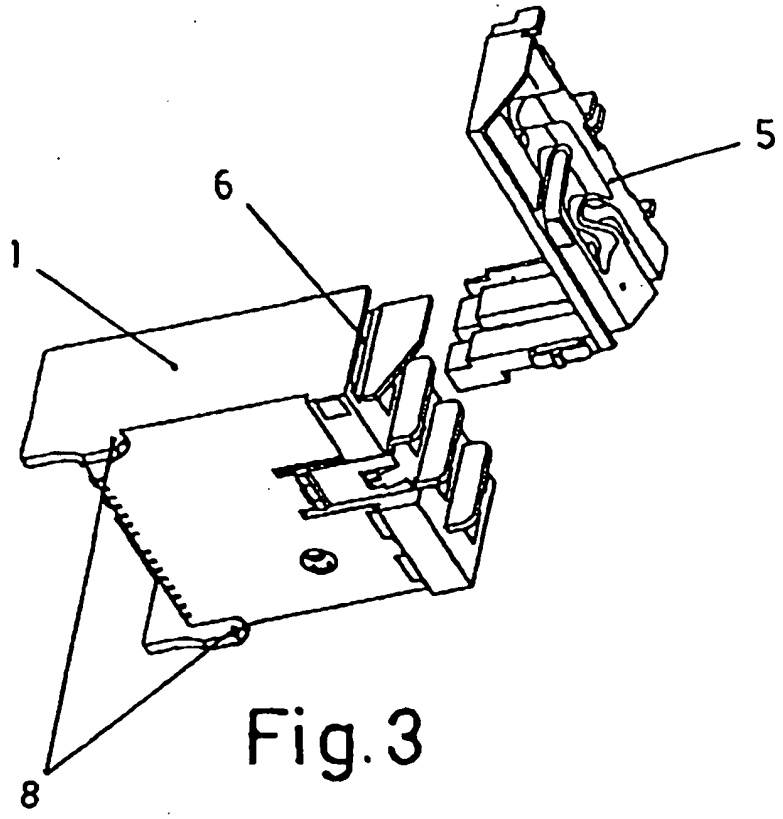

Fig.3

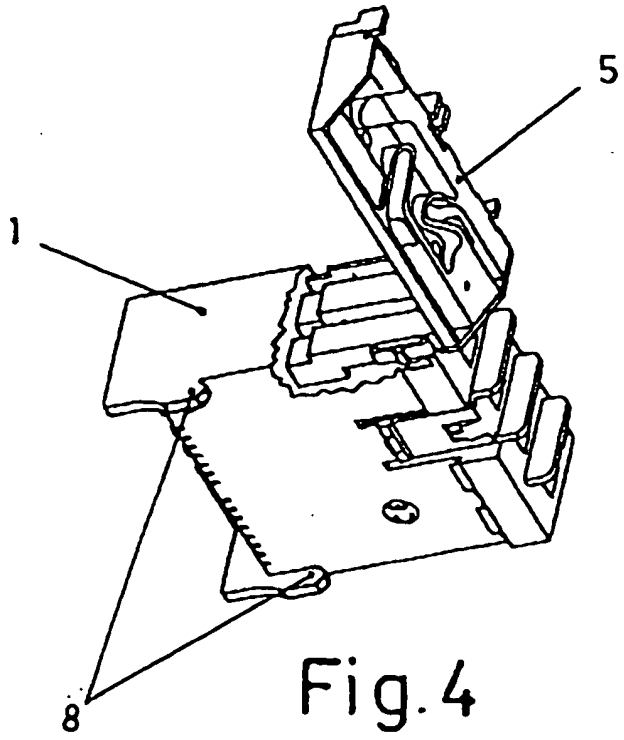

Fig.4

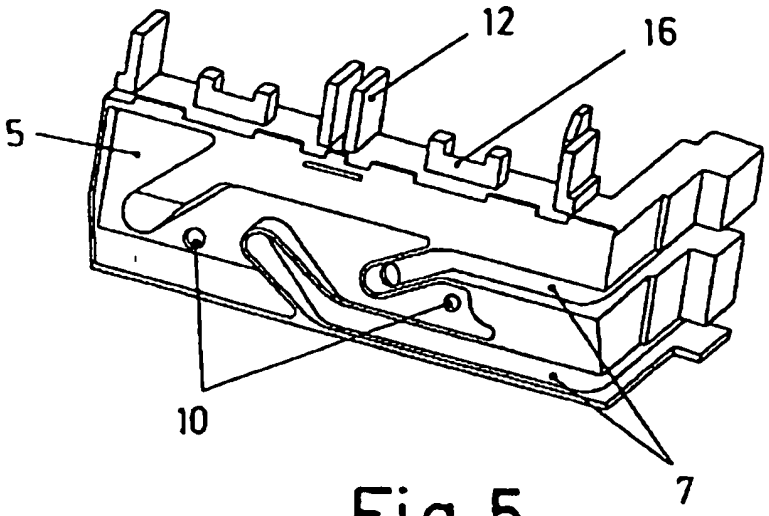

Fig. 5

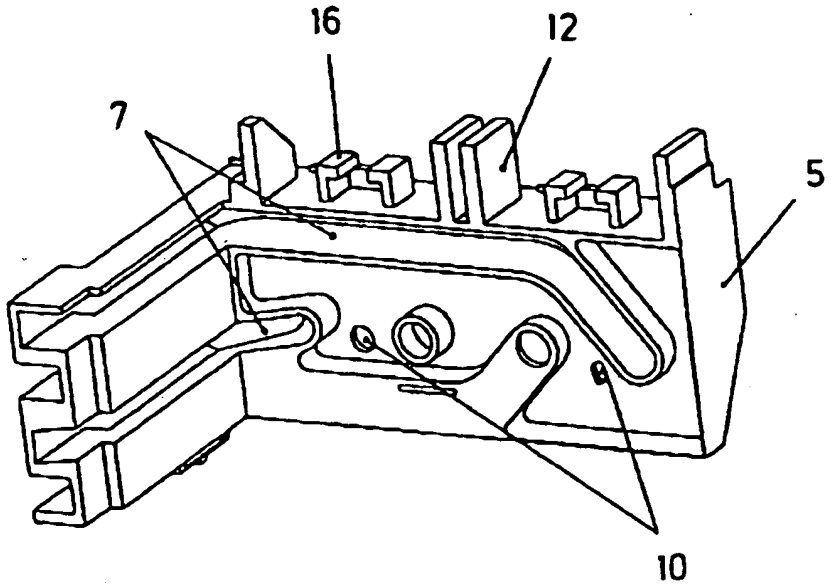

Fig 6

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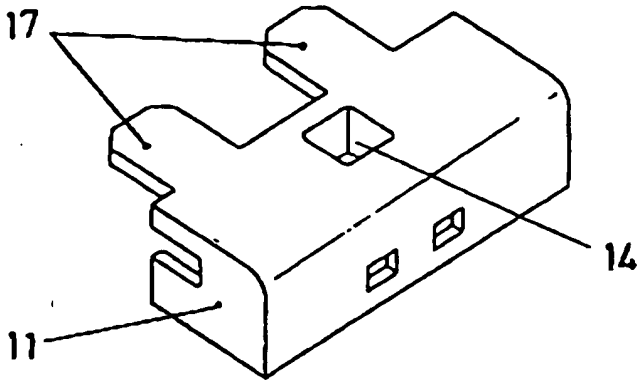

Fig. 7

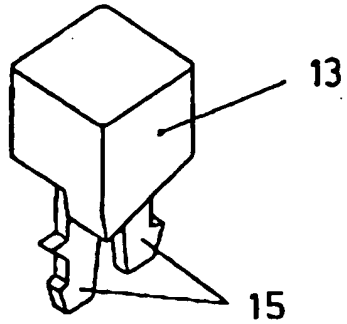

Fig. 8

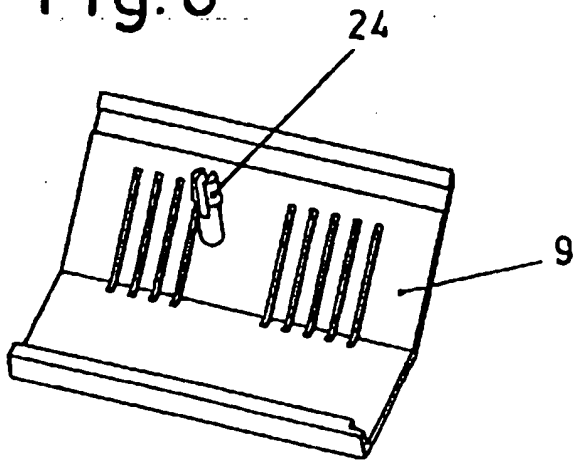

Fig. 9

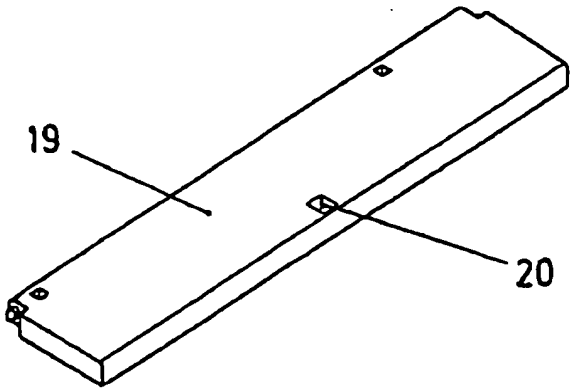

Fig.10

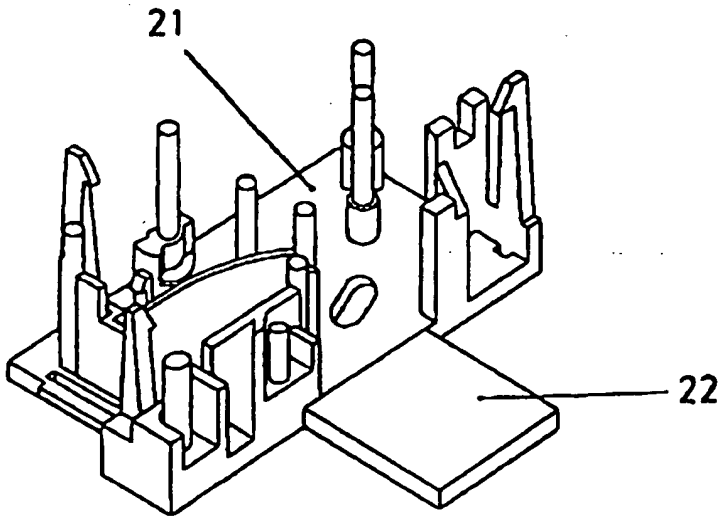

Fig.11

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/ ES/00/00174

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 H01H 71/02, H01H71/08, H01H73/06, H01H83/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC. WPI, CIBEPAT, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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A	EP 608 184 A1 (MERLIN GERIN) 27 July 1994 (27.07.94) the whole document	1-5
A	ES 2109913 T1 (FELTEN & GUILLEAUME AUSTRIA AG) 12 November 1997 (12.11.97) the whole document	1-5
A	EP 717425 A1 (BTICINO, S.P.A) 19 June 1996 (19.06.96) column 8, line 20- column 10, line 11; figures 1-6	1
A	EP 626711 A1 (BTICINO, S.P.A) 30 November 1994 (30.11.94) column 3, line 47; column 6 line 43; figure 1	1

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
19 June 2000 (19.06.00)	29 June 2000 (29.06.00)
Name and mailing address of the ISA/ S.P.T.O. Facsimile No.	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Information on patent family members

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